EXHIBIT A

Sears, Erin E.

From: White, Brandon M.
Sent: Tuesday, April 10, 2007 5:17 PM
To: Sears, Erin E.
Subject: FW: Bridgestone-Acushnet
Attachments: Rule 26(a)(2)(A) Disclosure Letter.pdf

From: Donnelly, Ken [mailto:DonnellyK@howrey.com]
Sent: Tuesday, January 16, 2007 8:35 PM
To: White, Brandon M.; Masters, Robert M.
Cc: Lavelle, Joseph; Seal, Brian; Stasio, Renee
Subject: RE: Bridgestone-Acushnet

Gentlemen:

Please find attached the following:

- An expert report of Dr. Jack Koenig on invalidity (Bridgestone's claims);
- An expert report of Dr. Jack Koenig on infringement (Acushnet's claims);
- An expert report of Dr. Felker on invalidity (Bridgestone's claims);
- An expert report of David Kaplan on damages (Acushnet's claims);
- A letter of disclosure pursuant to Rule 26(a)(2)(A)

Overnight we will copy any exhibits and attachments not already attached to these reports, and deliver those to you tomorrow by hand. Furthermore, the Lynch report on infringement will be delivered tomorrow as well, as agreed.

Sincerely,

Kenneth W. Donnelly
==========================
Howrey LLP
1299 Pennsylvania Avenue, N.W.
Washington, D.C. 20004
(202) 383-7495 (direct)
(202) 383-6610 (facsimile)
donnellyk@howrey.com

<<Rule 26(a)(2)(A) Disclosure Letter.pdf>> <<Invalidity Expert Report of Dr. Jack Koenig.pdf>> <<Infringement Expert Report of Dr. Jack Koenig.pdf>> <<Kaplan Report.pdf>> <<Kaplan Exhibits.pdf>> <<Invalidity Expert Report of David Felker.pdf>>

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EXHIBIT B

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February 22, 2007

BY FACSIMILE

Brandon M. White, Esq.
Paul, Hastings, Janofsky & Walker LLP
875 15th Street, N.W.
Washington, D.C. 20005

Re: *Bridgestone Sports Co. v. Acushnet Co.*,
C.A. No. 05-132 (JJF) (D. Del.)
Acushnet's Disclosure of Witnesses Under Rule 26(a)(2)(A)

Dear Brandon:

We have received your letter of February 13, in which you object to Acushnet's January 16 disclosure of 11 Acushnet employees as witnesses who may present evidence at trial under Rules 702, 703, or 705 of the Federal Rules of Evidence. We respond to your objections below.

First, you state that you "do not believe it is proper for Acushnet to call any of these employees as experts as none of them have provided an expert report." Your belief is unsupported (and unsupportable) by any reference to the Rules of Civil Procedure. Fed. R. Civ. P 26(a)(2)(B) expressly states that a written report is required for a witness "who is retained or specially employed to provide expert testimony in the case or whose duties as an employee of the party regularly involve giving expert testimony ...." The Rule's commentary further makes clear that "[t]he requirement of a written report ... applies only to those experts who are retained or specially employed to provide such testimony in the case or whose duties as an employee of a party regularly involve the giving of such testimony."

The case law, including Judge Farnan's decisions, is also clear on this issue. *See Upchurch v. Hester*, 2006 U.S. Dist. LEXIS 76776, at *6 (D. Del., Oct. 23, 2006) ("Not all identified experts must submit expert reports. Rather, expert reports only need to be submitted by those witnesses who are 'retained or specifically employed to provide expert testimony.'"). None of the 11 witnesses identified by Acushnet on January 16 was "retained or specially employed to provide expert testimony in the case" nor do the duties of any of the employees "regularly involve giving expert testimony." Accordingly, none of the employees identified by Acushnet on January 16 were required to submit a written report under Rule 26(a)(2)(B).

We ask as a professional courtesy that next time you send us a letter advancing a belief that we have failed to comply with the rules that you undertake a good faith effort to check the applicable rules and case law beforehand. Nevertheless, in the spirit of cooperation, we will

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agree not to call Mr. Gleadow, Dr. Rajagopalan or Mr. Bissonnette as expert witnesses at trial. We reserve the right, however, to call Dr. Rajagopalan and Mr. Bissonnette as fact witnesses.

Second, you state that "Acushnet has offered no information to explain the substance of these witnesses [sic] intended expert or opinion testimony" and ask us to "identify the substantive areas in which [we] expect these Acushnet employees to offer testimony." Again, the Federal Rules impose no such requirement. Fed. R. Civ. P. 26(a)(2)(A) provides only that "a party shall disclose to other parties ***the identity*** of any person who may be used at trial to present evidence under Rules 702, 703, or 705 of the Federal Rules of Evidence." (Emphasis added). By identifying the employees to you on January 16, Acushnet fully complied with that rule.

Again in the spirit of cooperation, we identify the following non-exhaustive list of substantive areas on which the witnesses may present evidence at trial under Rules 702, 703, or 705 of the Federal Rules of Evidence.

- Jeff Dalton – testing relied upon by Dr. Felker and Dr. Koenig and knowledge of one of ordinary skill in the art;
- Steve Aoyama – testing relied upon by Dr. Lynch and knowledge of one of ordinary skill in the art;
- Jay Williams – testing relied upon by Dr. Felker;
- Traci Olson – testing relied upon by Dr. Felker;
- Ken Welchman – information relied upon by Dr. Felker and knowledge of one of ordinary skill in the art;
- Rastko Gajic – information relied upon by Dr. Felker and knowledge of one of ordinary skill in the art;
- Pat Elliott – information relied upon by Dr. Felker and knowledge of one of ordinary skill in the art; and
- David Bulpett – testing relied upon by Dr. Felker and Dr. Koenig and knowledge of one of ordinary skill in the art.

Finally, you state that "three of these individuals (Pat Elliott, Scott Gleadow and Rasto Gajic) were never disclosed on Acushnet's initial disclosures" and that Bridgestone "objects to these three individuals being called at trial for any purpose." We note, however, that the Federal Rules provide separate disclosures for Rule 702, 703, or 705 witnesses – Rule 26(a)(1) covers initial disclosures, while Rule 26(a)(2) covers the disclosure of expert witnesses. Each of the witnesses identified by Acushnet on January 16 was timely disclosed pursuant to Rule 26(a)(2) and the Court's Scheduling Order.

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In any event, we note that Bridgestone did not disclose Nick Price as an expert witness until January 16, 2007, when it served his expert report on Acushnet. Similarly, Bridgestone did not disclose Kevin Jones as an expert witness until February 20, 2007, when it served Acushnet with a report jointly signed by Mr. Jones and Dr. Caulfield. Neither Mr. Price nor Mr. Jones – nor in fact any of Bridgestone's expert witnesses – were disclosed on Bridgestone's initial disclosures.

Accordingly, Acushnet stands on its January 16 identification of expert witnesses other than Mr. Gleadow, Dr. Rajagopalan, and Mr. Bissonnette.

Further, in response to your letter of February 15 regarding Mr. Dalton's deposition, he is available on March 1 and 2, for the depositions pursuant to Bridgestone's Tenth 30(b)(6) Notice, topics 5-6 of Bridgestone's Fifth through Eighth 30(b)(6) Notices and any deposition taken under Fed. R. Civ. P. 26(a)(4)(A).

Finally, in response to your letter of February 13 regarding Exhibit 48 of Dr. Felker's invalidity report, Acushnet will not reconsider its position. Dr. Felker is not relying on the golf balls identified in that exhibit as prior art, but only to inform his understanding of one of ordinary skill in the art regarding the standard percentage of dimple coverage in 1996.

Regards,

Brian S. Seal

EXHIBIT C

REDACTED

EXHIBIT D

REDACTED

EXHIBIT E

REDACTED

EXHIBIT F

REDACTED

EXHIBIT G

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February 7, 2007

70416.00002

VIA FACSIMILE TO 202-383-6610

Renee L. Stasio
Howrey LLP
1299 Pennsylvania Ave., N.W.
Washington, DC 20004

Re: *Bridgestone Sports v. Acushnet*

Dear Renee:

This is further to our email exchange and telephone conversation earlier today and to your letter from this afternoon.

You have asked whether Dr. Felker or Acushnet engineers might be permitted to conduct testing at Packer facilities. As a matter of corporate policy, Packer does not permit non-Packer employees to operate or use its equipment. If there is some other accommodation we can offer, please let me know.

You have also asked me to identify whether there are any other photographs of the golf balls tested by Dr. Caulfield. It is my understanding that all photographs were either included in Dr. Caulfield's expert report or have been produced subsequently. However, I will confirm my understanding and will let you know as soon as I can.

We also requested to inspect and possibly test the golf ball cores identified and relied upon by Dr. Felker in his report concerning his invalidity position with respect to Bridgestone's '707 patent based on EP 0 633 043. You informed me earlier today when we spoke by telephone that Acushnet would not provide these golf ball cores even though Dr. Felker is relying on them to support his invalidity positions. You informed me that these cores were manufactured and tested "a few years ago" in relation to an opinion of counsel. In light of this revelation, we believe the cores and any information related to those cores (privileged or not) should have been identified and produced during fact discovery, in view of Acushnet's intent to rely on them in this litigation as a basis of invalidity vis-à-vis the '707 patent.

If, as you stated, Acushnet is not going to provide these cores, we ask that you provide to us a privilege log. In this log, we request that you provide information sufficient to establish the privilege as to the cores and any documents or things related to the cores and Dr. Felker's invalidity position vis-à-vis the '707 patent. This would include the date on

which the cores were made and tested, at whose direction the cores were made and tested, the number of cores made. We also ask that you provide information sufficient to establish the privilege as to all other documents and things related in any way to these cores and Dr. Felker's invalidity position as to the '707 patent, including opinions of counsel, date, the general subject matter of such information, all addresses or recipients of such privileged information, and the basis on which privilege is being claims. Please also identify how many of the cores exist today, if any.

Finally, in paragraph 4 of your letter, it should be clear that the samples that we intend to make available tomorrow are those that were tested and relied upon by Dr. Caulfield. We do not intend to have samples of material tested by Dr. Coughlin or Dr. Isayev present.

If anything above is inaccurate or incomplete, please let me know as soon as possible.

Sincerely,

Brandon M. White
for PAUL, HASTINGS, JANOFSKY & WALKER LLP

LEGAL_US_E # 74183370.1

EXHIBIT H

REDACTED

EXHIBIT I

REDACTED

EXHIBIT J

REDACTED

EXHIBIT K

REDACTED

EXHIBIT L

US005782707A

United States Patent [19]

Yamagishi et al.

[11] Patent Number: 5,782,707

[45] Date of Patent: Jul. 21, 1998

[54] THREE-PIECE SOLID GOLF BALL

[75] Inventors: Hisashi Yamagishi; Hiroshi Higuchi, both of Chichibu, Japan

[73] Assignee: Bridgestone Sports Co., Ltd., Tokyo, Japan

[21] Appl. No.: 812,925

[22] Filed: Mar. 10, 1997

[30] Foreign Application Priority Data

Mar. 11, 1996 [JP] Japan 8-082121

[51] Int. Cl.[6] A63B 37/06; A63B 37/12; A63B 37/14

[52] U.S. Cl. 473/374; 473/373

[58] Field of Search 473/373, 374, 473/378, 384

[56] References Cited

U.S. PATENT DOCUMENTS

4,431,193	2/1984	Nesbitt	473/374
5,048,838	9/1991	Chikaraishi	473/373 X
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5,601,503	2/1997	Yamagishi et al.	473/351 X
5,688,191	11/1997	Cavallaro et al.	473/373

Primary Examiner—George J. Marlo
Attorney, Agent, or Firm—Sughrue, Mion, Zinn, Macpeak & Seas, PLLC

[57] ABSTRACT

The invention provides a three-piece solid golf ball featuring an increased flight distance on driver shots and improved control on approach shots. In a three-piece solid golf ball consisting of a solid core, an intermediate layer, and a cover, provided that hardness is measured by a JIS-C scale hardness meter, the core center hardness is up to 75 degrees, the core surface hardness is up to 85 degrees, the core surface hardness is higher than the core center hardness by 8 to 20 degrees, the intermediate layer hardness is higher than the core surface hardness by at least 5 degrees, and the cover hardness is lower than the intermediate layer hardness by at least 5 degrees.

6 Claims, 2 Drawing Sheets

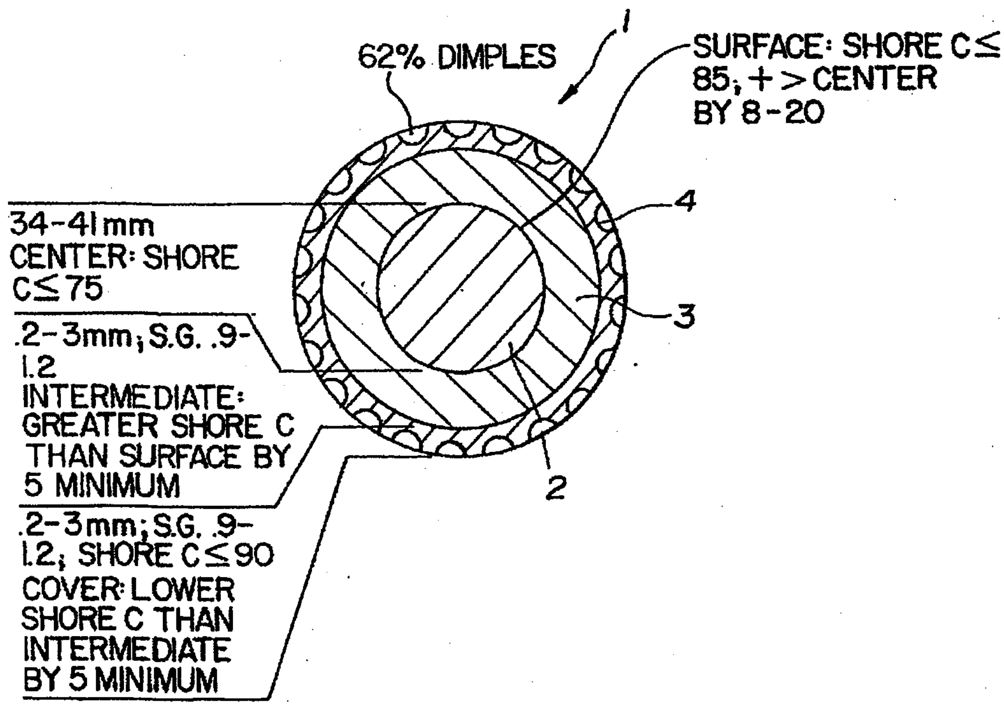


FIG.1

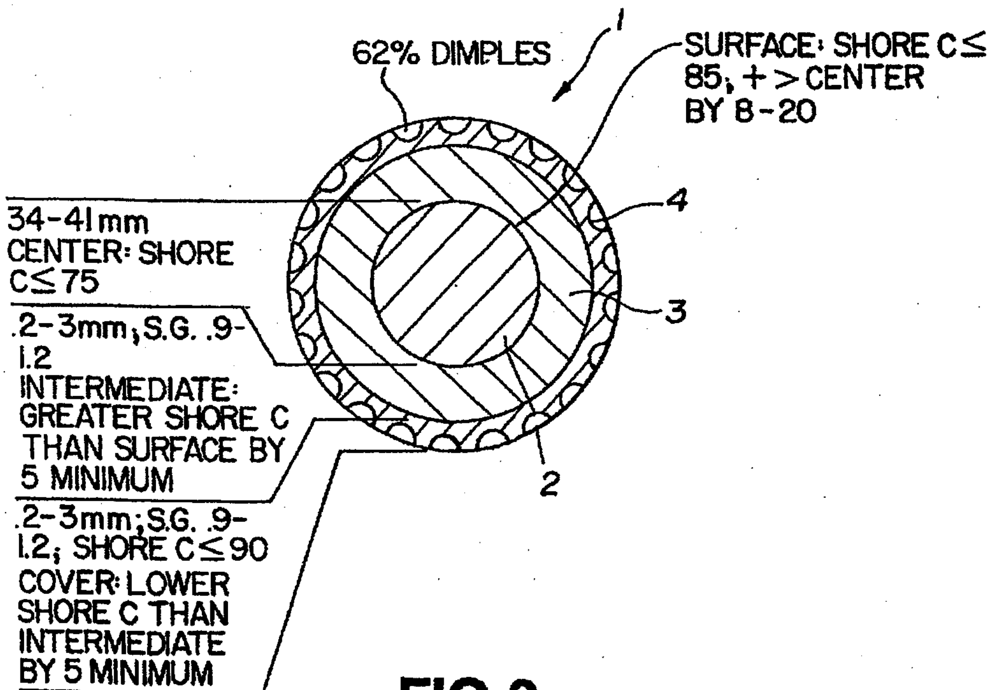
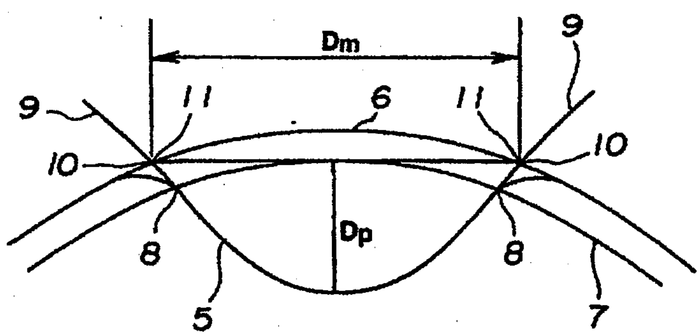

62% DIMPLES
1
SURFACE: SHORE C≤ 85; + > CENTER BY 8-20
4
3
2
34-41mm CENTER: SHORE C≤75
.2-3mm; S.G. .9-1.2 INTERMEDIATE: GREATER SHORE C THAN SURFACE BY 5 MINIMUM
.2-3mm; S.G. .9-1.2; SHORE C≤90 COVER: LOWER SHORE C THAN INTERMEDIATE BY 5 MINIMUM

FIG.2


Dm
9
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11
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11
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Dp
8
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FIG.3

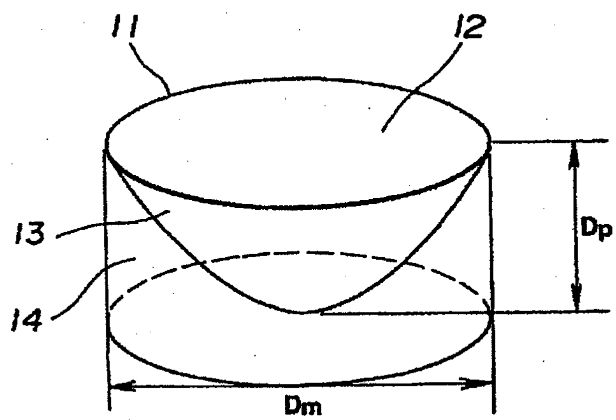
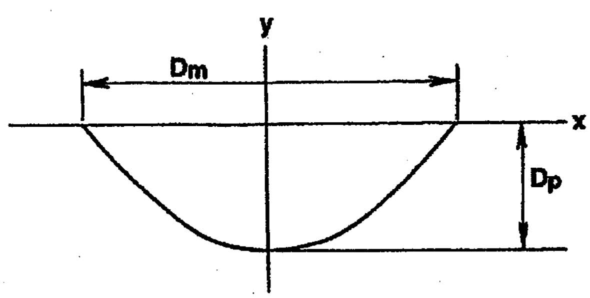


FIG.4



Patent provided by Sughrue Mion, PLLC - http://www.sughrue.com

THREE-PIECE SOLID GOLF BALL

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to a three-piece solid golf ball of the three-layer structure comprising a solid core, an intermediate layer, and a cover and more particularly, to such a three-piece solid golf ball which features an increased flight distance on full shots with a driver and improved control on approach shots with No. 5 iron or sand wedge.

2. Prior Art

From the past, two-piece solid golf balls consisting of a solid core and a cover are used by many golfers because of their flight distance and durability features. In general, two-piece solid golf balls give hard hitting feel as compared with wound golf balls, and are inferior in feel and control due to quick separation from the club head. For this reason, many professional golfers and skilled amateur golfers who prefer feel and control use wound golf balls rather than two-piece solid golf balls. The wound golf balls are, however, inferior in carry and durability to the solid golf balls.

More particularly, when two-piece solid golf balls are subject to full shots with a club having a relatively large loft angle, the ball flight is mainly governed by the club loft rather than the ball itself so that spin acts on most balls to prevent the balls from too much rolling. However, on approach shots over a short distance of 30 to 50 yards, rolling or control substantially differs among balls. The major cause of this difference is not related to the basic structure of the ball, but to the cover material. Then some two-piece solid golf balls use a cover of a relatively soft material in order to improve control on approach shots, but at the sacrifice of flight distance.

Controllability is also needed on full shots with a driver. If a soft cover is used as a result of considering too much the purpose of improving spin properties upon control shots such as approach shots with No. 5 iron and sand wedge, hitting the ball with a driver, which falls within an increased deformation region, will impart too much spin so that the ball may fly too high, resulting in a rather reduced flight distance. On the other hand, if the spin rate is too low, there arises a problem that the ball on the descending course will prematurely drop, adversely affecting the ultimate flight distance too. As a consequence, an appropriate spin rate is still necessary upon driver shots.

Anyway, the prior art two-piece solid golf balls fail to fully meet the contradictory demands of players, the satisfactory flight performance that the ball acquires an adequate spin rate upon full shots with a driver and the ease of control that the ball acquires a high spin rate upon approach shots with No. 5 iron and sand wedge.

SUMMARY OF THE INVENTION

An object of the present invention is to provide a three-piece solid golf ball which features an increased flight distance on full shots with a driver and improved control on approach shots with No. 5 iron or sand wedge.

Making extensive investigations on a three-piece solid golf ball of the three-layer structure comprising a solid core, an intermediate layer, and a cover, we have found that the above object is attained by optimizing the hardness distribution of the core, forming a hard intermediate layer between the core and the soft cover, and adjusting a percent dimple surface occupation. By virtue of the synergistic effect of these factors, the resulting golf ball travels an increased flight distance on full shots with a driver and is well controllable on approach shots with No. 5 iron or sand wedge.

More specifically, we have found that the following advantages are obtained in a three-piece solid golf ball of the three-layer structure comprising a solid core, an intermediate layer, and a cover, when the solid core, intermediate layer, and cover each have a hardness as measured by a JIS-C scale hardness meter, the core center hardness is up to 75 degrees, the core surface hardness is up to 85 degrees, the core surface hardness is higher than the core center hardness by 8 to 20 degrees, the intermediate layer hardness is higher than the core surface hardness by at least 5 degrees, and the cover hardness is lower than the intermediate layer hardness by at least 5 degrees. Upon deformation in an increased deformation region (associated with full shots with a driver), the presence of a hard intermediate layer between a soft deformable cover and a soft core ensuring soft feel is effective for reducing the energy loss by excessive deformation of the core and thereby enabling to form a structure of efficient restitution while maintaining the softness of the ball as a whole. Then the ball will travel an increased flight distance upon full shots with a driver. Although a soft cover is used, the ball gains an appropriate spin rate and is free of shortage of flight distance. At the same time, in a reduced deformation region (associated with approach shots), the ball gains an increased spin rate and is well controllable. Additionally, by adjusting dimples such that the percent surface occupation of dimples in the cover surface is at least 62% and an index (Dst) of overall dimple surface area is at least 4, and optimizing the dimple pattern, the flight properties (flight distance and flight-in-wind) of the golf ball are further enhanced. By virtue of the synergistic effect of these factors, the resulting golf ball covers an increased flight distance on full shots with a driver and is well controllable on approach shots with No. 5 iron or sand wedge, that is, satisfies the contradictory demands of players.

Therefore, according to the present invention, there is provided a three-piece solid golf ball of the three-layer structure comprising a solid core, an intermediate layer, and a cover, having a plurality of dimples in the ball surface. Provided that the solid core at its surface and center, the intermediate layer, and the cover each have a hardness as measured by a JIS-C scale hardness meter, the core center hardness is up to 75 degrees, the core surface hardness is up to 85 degrees, the core surface hardness is higher than the core center hardness by 8 to 20 degrees, the intermediate layer hardness is higher than the core surface hardness by at least 5 degrees, and the cover hardness is lower than the intermediate layer hardness by at least 5 degrees. The dimples occupy at least 62% of the ball surface.

In one preferred embodiment, the dimples in the ball surface total in number to 360 to 450 and include at least two types of dimples having different diameters. An index (Dst) of overall dimple surface area given by the following expression (1) is at least 4.

$$Dst = \frac{n \sum_{k=1}^{n} [(Dmk^2 + Dpk^2) \times V_0 k \times Nk]}{4R^2} \qquad (1)$$

wherein R is a ball radius, n is the number of dimple types, Dmk is a diameter of dimples k, Dpk is a depth of dimples k, Nk is the number of dimples k wherein k=1, 2, 3, . . . n, and V_0 is the volume of the dimple space below a plane circumscribed by the dimple edge divided by the volume of a cylinder whose bottom is the plane and whose height is the maximum depth of the dimple from the bottom.

Patent provided by Sughrue Mion, PLLC - http://www.sughrue.com

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a schematic cross-sectional view of a three-piece solid golf ball according to one embodiment of the invention.

FIG. 2 is a schematic cross-sectional view of a dimple illustrating how to calculate V_0.

FIG. 3 is a perspective view of the same dimple.

FIG. 4 is a cross-sectional view of the same dimple.

DETAILED DESCRIPTION OF THE INVENTION

Referring to FIG. 1, a three-piece solid golf ball 1 according to the invention is illustrated as comprising a solid core 2 having an optimized hardness distribution, a hard intermediate layer 3, and a soft cover 4.

In the golf ball 1 of the invention, the hardness distribution of the solid core 2 is optimized. More particularly, the core 2 is formed to have a center hardness of up to 75 degrees, preferably 60 to 73 degrees, more preferably 63 to 69 degrees as measured by a JIS-C scale hardness meter. The core 2 is also formed to have a surface hardness of up to 85 degrees, preferably 70 to 83 degrees, more preferably 73 to 80 degrees. If the core center hardness exceeds 75 degrees and the surface hardness exceeds 85 degrees, the hitting feel becomes hard, contradicting the object of the invention. It is noted that the hardness referred to herein is JIS-C scale hardness unless otherwise stated.

The core is formed herein such that the surface hardness is higher than the center hardness by 8 to 20 degrees, preferably 10 to 18 degrees. A hardness difference of less than 8 degrees would result in a hard hitting feel provided that the ball hardness and the core surface hardness are fixed. A hardness difference of more than 20 degrees would fail to provide sufficient restitution provided that the ball hardness and the core surface hardness are fixed. The hardness distribution establishing such a hardness difference between the surface and the center of the core ensures that the core surface formed harder than the core center is effective for preventing excessive deformation of the core and efficiently converting distortion energy into reaction energy when the ball is deformed upon impact. Additionally, a pleasant feeling is obtainable from the core center softer than the core surface.

The hardness distribution of the solid core is not limited insofar as the core is formed such that the core surface is harder than the core center by 8 to 20 degrees. It is preferable from the standpoint of efficient energy transfer that the core is formed such that the core becomes gradually softer from its surface toward its center.

The solid core preferably has a diameter of 34 to 41 mm, especially 34.5 to 40 mm. No particular limit is imposed on the overall hardness, weight and specific gravity of the core and they are suitably adjusted insofar as the objects of the invention are attainable. Usually, the core has an overall hardness corresponding to a distortion of 2.5 to 4.5 mm, especially 2.8 to 4 mm under a load of 100 kg applied, and a weight of 20 to 40 grams, especially 23 to 37 grams.

In the practice of the invention, no particular limit is imposed on the core-forming composition from which the solid core is formed. The solid core may be formed using a base rubber, a crosslinking agent, a co-crosslinking agent, and an inert filler as used in the formation of conventional solid cores. The base rubber used herein may be natural rubber and/or synthetic rubber conventionally used in solid golf balls although 1,4-cis-polybutadiene having at least

40% of cis-structure is especially preferred in the invention. The polybutadiene may be blended with a suitable amount of natural rubber, polyisoprene rubber, styrenebutadiene rubber or the like if desired. The crosslinking agent includes organic peroxides such as dicumyl peroxide, di-t-butyl peroxide, and 1,1-bis(t-butylperoxy)-3,3,5-trimethylcyclohexane, with a blend of dicumyl peroxide and 1,1-bis(t-butylperoxy)-3,3,5-trimethylcyclohexane being preferred. In order to form a solid core so as to have the above-defined hardness distribution, it is preferable to use a blend of dicumyl peroxide and 1,1-bis(t-butylperoxy)-3,3,5-trimethylcyclohexane as the crosslinking agent and the step of vulcanizing at 160° C. for 20 minutes. It is noted that the amount of the crosslinking agent blended is suitably determined although it is usually about 0.5 to 3 parts by weight per 100 parts by weight of the base rubber. The co-crosslinking agent used herein is not critical. Examples include metal salts of unsaturated fatty acids, inter alia, zinc and magnesium salts of unsaturated fatty acids having 3 to 8 carbon atoms (e.g., acrylic acid and methacrylic acid), with zinc acrylate being especially preferred. Examples of the inert filler include zinc oxide, barium sulfate, silica, calcium carbonate, and zinc carbonate, with zinc oxide and barium sulfate being often used. The amount of the filler blended is usually up to 40 parts by weight per 100 parts by weight of the base rubber although the amount largely varies with the specific gravity of the core and cover, the standard weight of the ball, and other factors and is not critical. In the practice of the invention, the overall hardness and weight of the core can be adjusted to optimum values by properly adjusting the amounts of the crosslinking agent and filler (typically zinc oxide and barium sulfate) blended.

The core-forming composition obtained by blending the above-mentioned components is generally milled in a conventional mixer such as a Banbury mixer and roll mill, compression or injection molded in a core mold, and then heat cured under the above-mentioned temperature condition, whereby a solid core having an optimum hardness distribution is obtainable.

The intermediate layer 3 enclosing the core 2 is preferably formed to a JIS-C hardness of 75 to 100 degrees, more preferably 80 to 98 degrees. The intermediate layer is formed to a hardness higher than the core surface hardness by at least 5 degrees, preferably 5 to 20 degrees, more preferably by 7 to 18 degrees. A hardness difference of less than 5 degrees would fail to provide sufficient restitution whereas a hardness difference of more than 20 degrees would result in a dull and rather hard hitting feel. The restitution of the core can be maintained by forming the intermediate layer to a higher hardness than the core surface hardness.

The gage, specific gravity and other parameters of the intermediate layer may be properly adjusted insofar as the objects of the invention are attainable. Preferably the gage is 0.2 to 3 mm, especially 0.7 to 2.3 mm and the specific gravity is 0.9 to less than 1.2, especially 0.94 to 1.15.

Since the intermediate layer 3 serves to compensate for a loss of restitution of the solid core which is formed soft, it is formed of a material having improved restitution insofar as a hardness within the above-defined range is achievable. Use is preferably made of a blend of ionomer resins such as Himilan (manufactured by Mitsui-duPont Polychemical K.K.) and Surlyn (E.I. duPont) as will be described later in Table 2. An intermediate layer-forming composition may be obtained by adding to the ionomer resin, additives, for example, an inorganic filler such as zinc oxide and barium sulfate as a weight adjuster and a coloring agent such as titanium dioxide.

The cover 4 enclosing the intermediate layer 3 must be formed to a lower hardness than the intermediate layer. That is, the cover has a hardness lower than the intermediate layer hardness by at least 5 degrees. Additionally, the cover is preferably formed to a JIS-C hardness of up to 90 degrees, more preferably 70 to 90 degrees, most preferably 75 to 87 degrees when spin properties in an approach range are of much account. A cover hardness in excess of 90 degrees on JIS-C scale would adversely affect the spin properties in an approach range so that professional and skilled amateur players who prefer accurate control reject use in the game. A cover hardness of less than 70 degrees would result in a ball losing restitution.

The gage, specific gravity and other parameters of the cover may be properly adjusted insofar as the objects of the invention are attainable. Preferably the gage is 0.2 to 3 mm, especially 0.7 to 2.3 mm and the specific gravity is 0.9 to less than 1.2, especially 0.93 to 1.15. The gage of the intermediate layer and cover combined is preferably 2 to 4.5 mm, especially 2.2 to 4.2 mm.

The cover composition is not critical and the cover may be formed of any of well-known stock materials having appropriate properties as golf ball cover stocks. For example, ionomer resins, polyester elastomers, and polyamide elastomers may be used alone or in admixture with urethane resins and ethylene-vinyl acetate copolymers. Thermoplastic resin base compositions are especially preferred. UV absorbers, antioxidants and dispersing aids such as metal soaps may be added to the cover composition if necessary. The method of applying the cover is not critical. The cover is generally formed over the core by surrounding the core by a pair of preformed hemispherical cups followed by heat compression molding or by injection molding the cover composition over the core.

Like conventional golf balls, the three-piece solid golf ball of the invention is formed with a multiplicity of dimples in the cover surface. The golf ball of the invention is formed with dimples such that, provided that the golf ball is a sphere defining a phantom spherical surface, the proportion of the surface area of the phantom spherical surface delimited by the edge of respective dimples relative to the overall surface area of the phantom spherical surface, that is the percent occupation of the ball surface by the dimples is at least 62%, preferably 63 to 85%. With a dimple occupation of less than 62%, the above-mentioned flight performance, especially an increased flight distance is not expectable. The total number of dimples is preferably 360 to 450, more preferably 370 to 440. There may be two or more types of dimples which are different in diameter and/or depth. It is preferred that the dimples have a diameter of 2.2 to 4.5 mm and a depth of 0.12 to 0.23 mm. The arrangement of dimples may be selected from regular octahedral, dodecahedral, and icosahedral arrangements as in conventional golf balls while the pattern formed by thus arranged dimples may be any of square, hexagon, pentagon, and triangle patterns.

Moreover, the dimples are preferably formed such that V_0 is 0.39 to 0.6, especially 0.41 to 0.58 wherein V_0 is the volume of the dimple space below a plane circumscribed by the dimple edge divided by the volume of a cylinder whose bottom is the plane and whose height is the maximum depth of the dimple from the bottom.

Now the shape of dimples is described in further detail. In the event that the planar shape of a dimple is circular, as shown in FIG. 2, a phantom sphere 6 having the ball diameter and another phantom sphere 7 having a diameter smaller by 0.16 mm than the ball diameter are drawn in conjunction with a dimple 5. The circumference of the other sphere 7 intersects with the dimple 5 at a point 8. A tangent 9 at intersection 8 intersects with the phantom sphere 6 at a point 10 while a series of intersections 6 define a dimple edge 11. The dimple edge 11 is so defined for the reason that otherwise, the exact position of the dimple edge cannot be determined because the actual edge of the dimple 5 is rounded. The dimple edge 11 circumscribes a plane 12 (having a diameter Dm). Then as shown in FIGS. 3 and 4, the dimple space 13 located below the plane 12 has a volume Vp. A cylinder 14 whose bottom is the plane 12 and whose height is the maximum depth Dp of the dimple from the bottom or circular plane 12 has a volume Vq. The ratio V_0 of the dimple space volume Vp to the cylinder volume Vq is calculated.

$$Vp = \int_0^{\frac{Dm}{2}} 2\pi xy\,dx$$

$$Vq = \frac{\pi Dm^2 Dp}{4}$$

$$V_0 = \frac{Vp}{Vq}$$

In the event that the planar shape of a dimple is not circular, the maximum diameter or length of a dimple is determined, the plane projected shape of the dimple is assumed to be a circle having a diameter equal to this maximum diameter or length, and V_0 is calculated as above based on this assumption.

Furthermore, provided that the number of types of dimples formed in the ball surface is n wherein $n \geqq 2$, preferably n=2 to 6, more preferably n=3 to 5, and the respective types of dimples have a diameter Dmk, a maximum depth Dpk, and a number Nk wherein k=1, 2, 3, . . . , n, the golf ball of the invention prefers that an index Dst of overall dimple surface area given by the following equation (1) is at least 4, more preferably 4 to 8.

$$Dst = \frac{\pi \sum_{k=1}^{n} [(Dmk^2 + Dpk^2) \times V_0 k \times Nk]}{4R^2} \tag{1}$$

Note that R is a ball radius, V_0 is as defined above, and Nk is the number of dimples k. The index Dst of overall dimple surface area is useful in optimizing various dimple parameters so as to allow the golf ball of the invention having the above-mentioned solid core and cover to travel a further distance. When the index Dst of overall dimple surface area is equal to or greater than 4, the aerodynamics (flying distance and flight-in-wind) of the golf ball are further enhanced.

While the three-piece solid golf ball of the invention is constructed as mentioned above, other ball parameters including weight and diameter are properly determined in accordance with the Rules of Golf.

The three-piece solid golf ball of the invention will travel an increased flight distance on full shots with a driver and be easy to control on approach shots with No. 5 iron or sand wedge.

EXAMPLE

Examples of the present invention are given below together with Comparative Examples by way of illustration and not by way of limitation. The amounts of components in the core, intermediate layer, and cover as reported in Tables 1 and 2 are all parts by weight.

Examples 1-5 and Comparative Examples 1-4

Solid cores: Nos. 1 to 6. were prepared by kneading components in the formulation shown in Table 1 to form a rubber composition and molding and vulcanizing it in a mold under conditions as shown in Table 1. The cores were measured for JIS-C hardness and diameter. with the results shown in Tables 3 and 4. The JIS-C hardness of the core was measured by cutting the core into halves, and measuring the hardness at the center (center hardness) and the hardness at core surface or spherical surface (surface hardness). The result is an average of five measurements.

TABLE 1

Core No.	1	2	3	4	5	6
Formulation						
Cis-1,4-poly-butadiene rubber	100	100	100	100	100	100
Zinc acrylate	24	24	25	29	15	34
Zinc oxide	29	26	34	27	33	25
Dicumyl peroxide	1	1	1	1	1	0
*1	0.3	0.3	0.3	0.3	0.3	1
Vulcanizing conditions						
Temperature, °C.	160	160	160	160	160	155
Time, min.	20	20	20	20	20	15
Core hardness*2, mm	3.7	3.7	3.5	3	5.7	2.2

*1 1,1-bis(t-butylperoxy)-3,3,5-trimethylcyclohexane (trade name Perhexa 3M-40 manufactured by Nippon Oil and Fats K.K.)
*2 distortion under a load of 100 kg

Next, compositions for the intermediate layer and cover were milled as shown in Table 2 and injection molded over the solid core and the intermediate layer, respectively, obtaining three-piece solid golf balls as shown in Table 4. At the same time as injection molding, two or three types of dimples were indented in the cover surface as shown in Table 3. Whenever the intermediate layer and cover were molded, the intermediate layer and cover were measured for JIS-C hardness, specific gravity and gage. The results are also shown in Table 4.

TABLE 2

Intermediate layer and cover formulations (pbw)	A	B	C	D	E
Himilan 1557*3	50	—	50	—	—
Himilan 1601*3	—	—	50	—	—
Himilan 1605*3	50	50	—	—	—
Himilan 1855*3	—	—	—	50	50
Himilan 1856*3	—	—	—	—	50
Himilan 1706*3	—	50	—	—	—
Surlyn 8120*4	—	—	—	50	—

*3 ionomer resin manufactured by Mitsui-duPont Polychemical K.K.
*4 ionomer resin manufactured by E.I. duPont of USA

TABLE 3

Dimple set	Diameter (mm)	Depth (mm)	V_0		Number	Dst	Surface occupation (%)
I	4.000	0.200	0.50		72	4.539	75
	3.850	0.193	0.50		200		
	3.400	0.170	0.50		120		
				total	392		
II	3.800	0.205	0.48		162	4.263	74
	3.600	0.194	0.48		86		
	3.450	0.186	0.48		162		
				total	410		
III	3.400	0.195	0.39		360	2.148	61
	2.450	0.195	0.39		140		
				total	500		

The thus obtained golf balls were evaluated for flight performance, spin, feel, spin control, and durability by the following tests.

Flight performance

Using a hitting machine manufactured by True Temper Co., the ball was actually hit with a driver (#W1) at a head speed of 45 m/s (HS45) and 35 m/sec. (HS35) to measure a spin, carry, and total distance.

Feel

Five golfers with a head speed of 45 m/sec. (HS45) and five golfers with a head speed of 35 m/sec. (HS35) actually hit the balls. The ball was rated according to the following criterion.

O:soft
Δ:ordinary
X:hard

Spin control

Three professional golfers actually hit the ball with No. 5 iron (#I5) to examine intentional hook and slice and stoppage on the green and also with a sand wedge (#SW) to examine spin on 30 and 80 yard shots (that is, stoppage on the green and ease of capture of the ball upon impact). An overall rating of the ball was derived from these spin control factors. The ball was rated "O" for easy control, "Δ" for ordinary, and "X" for difficult control.

Durability

Durability against continuous strikes and durability against cutting were evaluated in combination. The ball was rated according to the following criterion.

O:excellent
Δ:ordinary
X:inferior

TABLE 4

	Examples 1	Examples 2	Examples 3	Examples 4	Examples 5	Comparative Examples 1	Comparative Examples 2	Comparative Examples 3	Comparative Examples 4
Core									
Type	1	2	3	4	1	1	5	6	4
Center hardness A (JIS-C)	64	64	65	68	64	64	52	80	68
Surface hardness B (JIS-C)	75	75	77	82	75	75	62	90	82
B − A	11	11	12	14	11	11	10	10	14
Diameter (mm)	36.5	37.9	35.1	37.9	36.5	36.5	36.5	36.5	37.9
Intermediate layer									
Type	A	A	B	B	C	A	D	B	A
Hardness C (JIS-C)	86	86	93	93	83	86	75	93	86
C − B	11	11	16	11	8	11	13	3	4
Specific gravity	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Gage (mm)	1.6	1.2	1.8	1.2	1.6	1.6	1.6	1.6	1.8
Cover									
Type	E	E	C	F	D	E	B	A	B
Hardness D (JIS-C)	80	80	83	80	75	81	93	86	93
D − C	−6	−6	−10	−13	−8	−5	18	−7	7
Specific gravity	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Gage (mm)	1.5	1.5	2.0	1.5	1.5	1.5	1.5	3.5	2.0
Intermediate layer/cover combined gage (mm)	3.1	2.7	3.8	2.7	3.1	3.1	3.1	5.1	3.8
Dimple set	I	I	II	II	II	III	I	I	I
Ball outer diameter (mm)	42.7	42.7	42.7	42.7	42.7	42.7	42.7	42.7	42.7
#W1/HS45									
Spin (rpm)	2800	2750	2900	2700	2950	2800	2650	2700	2680
Carry (m)	209.0	210.0	210.0	209.5	210.5	207.0	209.0	207.5	208.5
Total (m)	223.0	224.5	223.5	222.0	224.0	218.0	221.0	217.0	218.0
Feel	O	O	O	O	O	O	Δ	X	X
#W1/HS35									
Spin (rpm)	4600	4400	4650	4700	4750	4600	4600	4680	4630
Carry (m)	142.0	144.0	142.5	144.0	143.0	138.0	142.5	139.0	140.0
Total (m)	150.0	153.0	150.0	152.5	152.0	145.0	149.5	145.5	148.0
Feel	O	O	O	O	Δ	O	Δ	X	X
Spin control	O	O	O	O	O	O	X	Δ	X
Durability	O	O	O	O	O	O	X	Δ	Δ

Note:
A hardness difference is represented by (B − A), (C − B), and (D − C). (B − A) is equal to the core surface hardness minus the core center hardness; (C − B) is equal to the intermediate layer hardness minus the core surface hardness; and (D − C) is equal to the cover hardness minus the intermediate layer hardness.

As is evident from Table 4, the ball of Comparative Example 1 which is identical with the ball of Example 1 except for the dimple set is unsatisfactory in flight distance because the dimple surface occupation is as low as 61%. The ball of Comparative Example 2 is inferior in hitting feel, spin control, and durability since the cover is harder than the intermediate layer. The ball of Comparative Example 3 is unsatisfactory in flight distance and hitting feel because the core surface hardness and core center hardness are too high and the hardness difference between the intermediate layer and the core surface is too small. The ball of Comparative Example 4 is inferior in flight distance, hitting feel, and spin control since the cover is harder than the intermediate layer and the intermediate layer is insufficiently harder than the core.

In contrast, the golf balls of Examples 1 to 5 within the scope of the invention receive an appropriate spin rate upon full shots with a driver to travel a longer flight distance, are easy to spin control upon approach shots, and are excellent in both hitting feel and durability.

Japanese Patent Application No. 82121/1996 is incorporated herein by reference.

Although some preferred embodiments have been described, many modifications and variations may be made thereto in the light of the above teachings. It is therefore to be understood that within the scope of the appended claims, the invention may be practiced otherwise than as specifically described.

We claim:

1. A three-piece solid golf ball of the three-layer structure comprising a solid core, an intermediate layer, and a cover, having a plurality of dimples in the ball surface wherein

the solid core, intermediate layer, and cover each have a hardness as measured by a JIS-C scale hardness meter wherein the core center hardness is up to 75 degrees, the core surface hardness is up to 85 degrees, the core surface hardness is higher than the core center hardness by 8 to 20 degrees, the intermediate layer hardness is higher than the core surface hardness by at least 5 degrees, and the cover hardness is lower than the intermediate layer hardness by at least 5 degrees, and

the dimples occupy at least 62% of the ball surface.

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2. The three-piece solid golf ball of claim 1 wherein said intermediate layer has a gage of 0.2 to 3 mm and a specific gravity of 0.9 to less than 1.2.

3. The three-piece solid golf ball of claim 1 wherein said cover is based on a thermoplastic resin and has a hardness of up to 90 degrees as measured by the JIS-C scale hardness meter.

4. The three-piece solid golf ball of claim 1 wherein said cover has a gage of 0.2 to 3 mm and a specific gravity of 0.9 to less than 1.2.

5. The three-piece solid golf ball of claim 1 wherein said solid core is formed of a cis-1,4-polybutadiene base elastomer and has a diameter of 34 to 41 mm.

6. The three-piece solid golf ball of claim 1 wherein the dimples in the ball surface total in number to 360 to 450 and include at least two types of dimples having different diameters, and an index (Dst) of overall dimple surface area given by the following expression is at least 4,

$$Dst = \frac{\pi \sum_{k=1}^{n} [(Dmk^2 + Dpk^2) \times V_0 k \times Nk]}{4R^2}$$

wherein R is a ball radius, n is the number of dimple types ($n \geq 2$), Dmk is a diameter of dimples k, Dpk is a depth of dimples k, Nk is the number of dimples k wherein k=1, 2, 3, . . . n, and V_0, is the volume of the dimple space below a plane circumscribed by the dimple edge divided by the volume of a cylinder whose bottom is the plane and whose height is the maximum depth of the dimple from the bottom.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

Page 1 of 2

PATENT NO. : 5,782,707
DATED : July 21, 1998
INVENTOR(S) : Hisashi Yamagishi et al.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Please add claims 7-17 as follows:

7. The three-piece solid golf ball of claim 6 wherein Dmk is in the range of 2.2 to 4.5 and Dpk is in the range of 0.12 to 0.23 mm.

8. The three-piece solid golf ball of claim 6 wherein V_0 is in the range of 0.39 to 0.6.

9. The three-piece solid golf ball of claim 1 wherein said core center hardness is in the range of 60 to 73 as measured on JIS-C.

10. The three-piece solid golf ball of claim 1 wherein said core has a surface hardness in the range of 70 to 83 degrees on JIS-C.

11. The three-piece solid golf ball of claim 1 wherein said core surface hardness is higher than the center hardness by 10 to 18 degrees.

12. The three-piece solid golf ball of claim 1 wherein said solid core has a distortion in the range of 2.5 to 4.5 mm under an applied load of 100 kg.

13. The three-piece solid golf ball of claim 1 wherein said intermediate layer has a hardness in the range of 75 to 100 degrees measured on JIS-C.

14 The three-piece solid golf ball of claim 1 wherein said intermediate layer has a hardness higher than the core surface hardness by t to 20 degrees.

15. The three-piece solid golf ball of claim 1 wherein said cover has a hardness in the range of 70 to 90 degrees measured on JIS-C.

Patent provided by Sughrue Mion, PLLC - http://www.sughrue.com

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 5,782,707
DATED : July 21, 1998
INVENTOR(S) : Hisashi Yamagishi et al.

Page 2 of 2

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

16. The three-piece solid golf ball of claim 1 wherein the gage of the intermediate layer and the cover combined is in the range of 2 to 4.5 mm.

17. The three-piece solid golf ball of claim 1 wherein said dimples occupy 63 to 85% of the ball surface

Signed and Sealed this

Sixth Day of November, 2001

Attest:

Nicholas P. Godici

NICHOLAS P. GODICI

Attesting Officer *Acting Director of the United States Patent and Trademark Office*

EXHIBIT M

REDACTED

EXHIBIT N

REDACTED

EXHIBIT O

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

BRIDGESTONE SPORTS CO., LTD., and BRIDGESTONE GOLF, INC.,	)	
Plaintiffs,	)	
v.	)	
ACUSHNET COMPANY,	)	C. A. No. 05-132 (JJF)
Defendant.	)	

DECLARATION OF GERALD (JERRY) M. BELLIS

I, Gerald (Jerry) M. Bellis, hereby state as follows:

1) I am employed by Acushnet Company ("Acushnet"). I am currently the Executive Vice President of Titleist Sales and Marketing Worldwide. I have been employed by Acushnet since 1983. I joined the company as a market analyst, an entry level position. I worked my way up through product line responsibility at Acushnet. I was a product manager for golf accessories, a Business Manager for various products,. Director of all golf ball products, and finally assumed responsibility for the sales and marketing of all products bearing the Titleist brand. I have spent the last 24 years marketing golf related products, primarily golf balls, in the Acushnet company.

2) I was awarded my BS in Business Administration from Bentley College in 1982 and did graduate work at Babson College.

3) I was a competitive junior golfer in New England, played on the University of Florida golf team, and was captain of Bentley College golf team. I continue to be

an avid golfer and have been Club Champion at New Seabury CC and The Ridge Club.

QUALIFICATIONS.

4) I have been involved in the marketing and sales of golf balls for over 24 years. I have personal knowledge of the changes in the golf ball marketplace during those times. I have also investigated Acushnet's prior history in the golf ball business from company records and the like. In 2006, I acted as a moderator for a film, called *A Passion for Excellence*, that we prepared to celebrate the history of quality products Acushnet has designed and sold under the *Titleist* brand name.
5) By my education and first hand experience in the industry, I am qualified to testify as an expert in the golf ball marketplace, the innovations in the golf ball marketplace, and the real world acceptance and use of golf ball products among professional golfers, skilled amateurs, and novice golfers.
6) I have not authored any articles in the past ten years.
7) I have never testified before as an expert. I am not being paid by Acushnet to testify as an expert witness. I am employed by Acushnet and draw a salary, but my compensation is in no way dependent on my testimony or the outcome of the case.

ACUSHNET COMPANY, ITS HISTORY AND ITS APPROACH.

8) Initially, I want to address our company, our commitment to quality and innovation, and the manner in which we market our products. I have read the declarations of Messrs. Blair and Calabria. Those declarations very badly misrepresent our company, our success, our commitment to quality goods, and the innovation driven excellence that we insist on to serve all of our customers. I initially want to set that record straight.

Vision and Mission

9) Acushnet started its golf ball business in 1932 with the mission of providing the serious golfer with a golf ball that is quality and performance superior to all other golf balls available. The Titleist golf ball originated from the pursuit to make golf a more rewarding test of skill by guaranteeing the same performance excellence in

every golf ball. The vision was to establish a single brand that represented the highest quality and performance standards, and a brand endorsed and recommended by the golf professional and golf pro shop, as being the best person and place to represent and reinforce Titleist's premium quality and performance.

10) This mission is also based upon the premise that by delivering to the quality and performance expectations of the best players in the world (the pyramid of influence), Titleist will to deliver the golf ball quality and performance promise to all golfers. Today, our mission still remains the continued pursuit of performance superior and quality superior golf balls, through better designs and better manufacturing processes.

History Overview

11) In 1932, Phil Young, a dedicated amateur golfer and owner of a precision molded rubber company, missed a well-stroked putt in a match with his dentist. Frustrated that no matter whom the manufacturer, never more than two out of any dozen balls ever performed to the same expectations, Young and his opponent went to the dentist's office, x-rayed the golf ball in question and found that its core was, in fact, off-center.

12) With his discovery, Phil Young persuaded Fred Bommer, a fellow MIT graduate, rubber specialist and avid golfer, to head up the Acushnet Golf Division. They set out to develop the highest quality and performance golf ball; one that would be uniform and consistent in quality, ball after ball. It took Young and Bommer three painstaking years to perfect the first Titleist golf ball, but when it was ready in 1935, it could truthfully be introduced to club professionals and golfers as the best golf ball ever made.

Process Excellence

13) Applying a lesson well learned, Young implemented a quality control check that is still in practice today. Every balata ball then and every Pro V1 and Pro V1x golf ball now was and is x-rayed. Through the years, advancements in and new process technologies have allowed us to further tighten our manufacturing tolerances.

Computers and quality assurance teams monitor every stage of the manufacturing process, utilizing best-in-class equipment to achieve the most exacting standards in the industry.

14) For over 55 years, all Titleist golf balls were produced at Ball Plant 1. The design and process technologies evolved from making only liquid center wound balata-covered golf balls to also producing the additional technologies of solid center wound balata-covered, solid center wound Surlyn-covered, solid center Surlyn-covered, liquid center wound Surlyn-covered, liquid center wound Elastomer-covered and solid center Elastomer-covered.

15) In 1990, Ball Plant 2 started production to expand capacity and with a focus on making solid construction Surlyn-covered technology products. Ten years later, in 2000, Ball Plant 3 started production to expand capacity and with a focus on making multi-layer, solid construction elastomer-covered technology products.

16) A belief that a better process will result in a better quality and performance product has been constant throughout Titleist's history. An unwavering commitment to continuous improvement and performance and quality excellence are core values of the Titleist tradition.

Design Excellence

17) After significant advancement in the quality and performance of the golf ball through a better process, the next advancements in Titleist golf balls came with a commitment and emphasis on research and development to design a better performing golf ball. Titleist developed the first mechanical golfer to provide true tests of new product designs and was the first to use a stroboscopic camera to measure golf ball deformation and recovery at impact.

18) In the 1960's, Titleist embarked into the advancement of golf ball aerodynamics with the use of wind tunnel testing and computer analysis. Titleist was also the leader in cover technologies in pioneering the use of synthetic balata and later the cast urethane covers for Tour-played golf balls.

19) Titleist is also the pioneer in understanding the launch conditions (speed, angle and spin) of a golf ball after impact and their effect on golf ball performance. With the

development and use of a launch monitor, Titleist determined the launch conditions of different types of players from professionals to serious amateurs to recreational golfers to best design golf balls to meet their different specific needs.

20) The design of Titleist golf balls also continued to evolve along with the onset of stronger and faster swings and impacts by the player and with the evolution of golf club designs (square grooves and oversize metal drivers) as these all affect the launch conditions and optimum ball performance and design. Our talented golf ball development teams continually challenge themselves to implement technological advancements in the design, material and manufacturing process of our golf balls.

Pro Partnership Excellence

21) Part of the vision of Titleist is that it be the leading brand of the golf professional and the golf pro shop, as being the best person and place to represent and reinforce Titleist's premium quality and performance. The personal use, endorsement and recommendation by the golf professional was the foundation of Titleist's early success and remains an important competitive advantage today.

22) The golf professional and on-course market remains the top priority for Titleist. Titleist golf ball usage by the PGA Golf Professional is over 80% and our on-course market share is near 70%.

The Pyramid of Influence

23) The Pyramid of Influence strategy is that the very best golfers would demand and prefer the very best product to maximize their performance, and that serious amateur golfers would watch and follow the example established by those professional golfers. The Titleist Pyramid of Influence strategy is that this is best accomplished and most effective when a golf ball is the most preferred by many golfers rather than the ball of choice or endorsement by an elite few.

24) This strategy has been successful in making and keeping Titleist the #1 ball in golf without the endorsement of many of the game's top ranked players, such as Sam

speeds to the drivers, and sought longer distance golf balls to complement their strengths.

80) Second, golf ball companies like Acushnet and Spalding improved their solid construction technology throughout the 1990s. Among all except the pro players, solid construction golf balls were well established and accepted by the 1990s.

81) Third, the advent of metal woods in the early 1990s, and the subsequent development of oversized metal woods and, in 1995, titanium metal drivers increased the demand for low spin, long distance golf balls.

82) The success that Tiger Woods had in 2000 with the Nike ball certainly raised the level of interest in solid balls, although most pros and other players did not switch to the Nike ball, or to the Callaway ball when that solid construction ball was introduced in 2000.

83) Finally, our successful introduction of the Pro V1 technology finally provided golfers with a solid construction ball that gave them the exceptional distance and other playing characteristics that golfers at all levels sought.

84) In my opinion, Bridgestone was not a leader or important force in the development of solid golf balls in the US market or on the US PGA Tour. For all of the 1990s, they were a minor player in the US golf ball market. In my opinion the leaders in solid golf ball development were Spalding/Top-Flite and Acushnet, as we developed and sold the most solid construction golf balls in the US and worldwide.

CONCLUSION

85) I reserve the right to supplement and expand my report between now and trial. I also reserve the right to develop demonstrative exhibits to demonstrate my testimony at trial.

I declare, under penalty of perjury, that the foregoing is true and correct

Gerald M Bellis

Jerry Bellis 02-20-2007

Executed on 20th February 2007.

Materials consulted in preparing this report

1) Darrell Survey Tour Counts 1961-2006
2) Darrell Survey Consumer Research 1990-2006
3) Market research, Audits & Surveys Inc., 1973-1996
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5) Titleist catalogs and price lists 1957-2006
6) Titleist ad reprints 1935-2006
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8) D. Young, A History of the Acushnet Co.; The First 70 Years
9) Titleist's USGA files on regulatory changes
10) *Golf World* 1990-2006
11) Media press clippings 2000-2006
12) MPG Media for Share of Voice reporting Ad Views and AdRelevance data 1992-2006
13) Historical archives inclusive of trade letters, memos, documents, interviews and media articles

EXHIBIT P

REDACTED

EXHIBIT Q

REDACTED